

Title: Trail Mix

Link to Outcomes:

- **Problem Solving** Students will develop and apply strategies to solve a wide variety of problems and verify and interpret results with respect to the original problem.
- **Communication** Students will reflect on and clarify their thinking about mathematical ideas and situations and realize that representing, discussing, writing, and listening to mathematics are vital parts to learning and using mathematics.
- **Reasoning** Students will draw logical conclusions about mathematics and justify their answers and solution processes.
- **Connections** Students will link conceptual and procedural knowledge and use mathematics in their daily lives.
- **Estimation** Students will determine the reasonableness of results and apply estimation in working with quantities, measurement, computation, and problem solving.
- **Number Sense** Students will interpret the multiple uses of numbers encountered in the real world.
- **Measurement** Students will develop the process of measuring and concepts related to units of measurement; make and use estimates of measurement; and make and use measurements in problems and everyday situations.
- **Statistics** Students will collect, organize, and describe data; construct, read, and interpret displays of data; and formulate and solve problems that involve collecting and analyzing data.
- **Fractions** Students will develop concepts of fractions, mixed numbers, and decimals; find equivalent fractions; and apply fractions and decimals to problem situations.
- **Relationships** Students will represent and describe mathematical relationships.

Brief Overview:

This activity integrates fractions and measurement with the real-life application involved in creating a recipe and adapting it to meet the needs of the students. The students will survey individual preferences, then graph the collected data. Students will then perform mathematical computations in order to derive the measurements for their recipe. Throughout the unit, they will keep a journal with anecdotal records.

Grade/Level:

Grades 4-5

Duration/Length:

This activity should take 1-2 weeks. Some activities may take longer than anticipated.

Prerequisite Knowledge:

- Students should understand basic mathematical computations using fractions.
- Students should be able to interpret surveys and a variety of graphs.
- Students should be able to solve problems using money.

Objectives:

- Keep an anecdotal record of lessons.
- Collect and organize data.
- Transform data into fractions and percentages.
- Construct a variety of graphs.
- Interpret graphs.
- Perform calculations on fractions to obtain measurements.
- Find cost of supplies.
- Apply knowledge learned to everyday situations.

Materials/Resources/Printed Materials:**Materials for class**

- Ingredients for recipe (Specifications to be determined - See **Day 2**)
- Large bowl to mix ingredients
- Measuring utensils
- Lost Lake by Allen Say
- Pancake, Pancake by Eric Carle

Materials per student

- Journal (Contains cover page and activity sheets (Student Resources #1-5). The teacher will need to supply lined paper to be placed at back of journal.)
- Explorer calculator
- One paper cup
- Performance Task Packet - Salad activity (Contains cover page and activity sheets (Student Resources #6-10). The teacher will need to supply lined paper to be placed at back of packet.)

Development/Procedures:

Day 1 - Students will keep an anecdotal record of lesson and record data. (Teacher may want to collect journals each day to check for progress).

- Introduce students to the unit by reading Lost Lake. Discuss story with students focusing their attention on the supplies needed for camping. Ask students what snack foods they enjoy while camping. List these on a web. If “trail mix” is not listed, ask students if they have ever mixed snack foods and called it “trail mix.” Then, ask them to name eight ingredients they would want to include, if the class made trail mix. List the ingredients on the board.
- Ask the following (*Think-Pair-Share*):
 - How do we determine the amount of each item?
 - Should the amounts be the same? Why or why not?
 - What is an easy way to determine each student's likes/dislikes?

(The general idea/concept is if we took a survey of everyone's preferences we would know the amount of each item to include. Example: If three students chose raisins, then we would need to include 3 “portions” of raisins in the mix.)

- Pass out the journals and ask students to look at the survey sheets. Ask the children to list the ingredients on the first column of their survey sheet, then ask them to vote for their four favorite ingredients under the second column. In their journals, ask the children to predict what they think the results of the survey will reveal and explain their reasoning. Collect journals.

Day 2 - Students will collect and organize data. They will transform data into fractions and decimal form. Calculators should be used to check their calculations.

- Pass out journals and ask a few children to share their responses. Collect individual data to make class totals. Children will record class totals for each item on their individual survey sheets under the third column. Students will take the number from the class preference column; change it into a fraction that represents the class preference for that item; reduce it, if necessary; and record that number in the next column (Fractional Part).

Example: $\frac{\text{\# of children that voted for that item}}{\text{total \# of children voting}}$

- Ask children to use their calculators to turn the fractions into percents and record in the “Percentage of Class Column.” These percentages will be used to create a circle graph. Ask the students to write in their journals to explain three pieces of information that they were able to gather from the chart. Collect journals.

Day 3 - Students will create a graph using data from their survey chart and write three pieces of information that they learned from looking at the graph.

- Ask students to *pair-share* their journal entries from yesterday

- Discuss various ways of presenting data. Lead the discussion towards graphs. Talk about possible reasons for graphs and which would best suit our needs. Ask students what is needed to construct a graph (title, labels for axis, data). Tell them that they are going to make two different types of graphs using the same data. The first graph can be a bar or pictograph, but the second graph should be a circle graph in order to use the percentages.
- Using the data from the class preference column on their survey chart, students make the first graph. This graph will be drawn on a graph activity sheet (Student Resource #3). Below the graph, they will include at least 3 pieces of information that they were able to acquire from studying this graph. Teacher collects journals.

Day 4 - Students will create a circle graph and interpret the data.

- Review yesterday's discussion of graphs and share some of the journal responses.
- Ask students to look at the "Percentage of Class" column (column #5). Ask students how they could use this information to create a circle graph. At this point, teachers may want to review "Fractions Are Fun" (Student Resource #4) with students. This will give students a visual representation of the final product for **Day 4's** objective. Student Resource #5 includes a circle divided into eight equal parts. Each part is 12.5% of the total; this will provide the students with "bench marks" to begin calculating the sections that are representative of the class preference. Label each section of the circle graph.
- Having completed the circle graph, the students should write three pieces of information that they were able to find by studying the graph. Ask students to compare the circle graph to the graph they made the day before. Ask the following questions:
 - Which graph is easier to read? Why?
 - Which graph is more accurate? Why?
- Complete these thoughts in student journals. Collect journals.

Day 5 - Students will perform calculations on fractions to obtain measurements and find cost of supplies.

- Share journal entries about the comparison of the two graphs.
- Review the procedures completed to this point.
- Read Pancake, Pancake to the class. Summarize the story with the class. Ask students the following:
 - What else is needed in order to make this mix? (**portion size and purchase of the ingredients**).
 - If each child is to receive 1 cup of trail mix how many cups do we need to have in order for everyone to get 1 cup? (**the number of total students**).
 - Should we buy the same amount of each item? Why? Why not? (**No, that is why we did the survey.**)

- Brainstorm ideas of how to determine the amount of each item to buy. Remind students that everyone voted for four items and everyone is going to get 1 cup (Divide 1 cup per student by four choices = $\frac{1}{4}$ cup of that ingredient for every person who chose it).
- Refer to the survey sheet (Student Resource Sheet #2) and explain that prices were found for each item by going to the bulk section in the grocery store. The teacher will tell the students the cost per cup of each item, as the students enter the prices under the “Cost Per Cup” column. Ask students how to find the total cost for each item? **(Determine the number of cups used and multiply that by the price. If there was less than a cup used for a certain ingredient, find the cost per $\frac{1}{4}$ cup by dividing by 4.)** After completing the chart, children are to explain in their journals how they figured out the cost for three individual ingredients.
- Make trail mix according to our data and enjoy.

Days 6,7,8 -Students will complete a performance assessment task.

- Hand-out performance assessment task for the evaluation of the learning unit. Provide ample time for students to complete. Students should be allowed to use calculators.

Evaluation:

Students will be evaluated on the following criteria:

- participation in daily discussions.
- completion of the assignments in activity packet and assigned journal entries.
- performance assessment. Using the information gained in this unit, prepare a salad for a party.

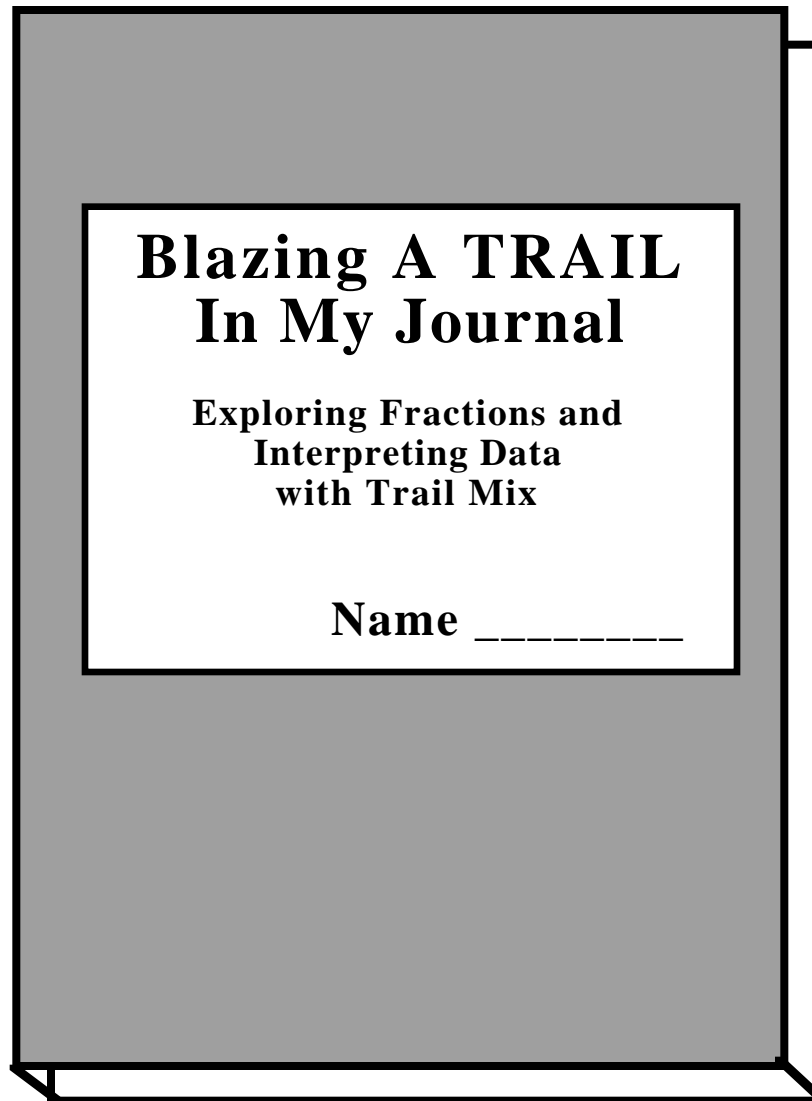
Extension/Follow Up:

- A possible extension could be to change the number of preferences, the serving size, and/or the price per cup.
- If given a certain amount of money, students are to determine type and quantity of ingredients to feed a specific number of people.
- Students can create their own performance task and complete it.

Authors:

Cynthia L. Cowan
Glenallan Elementary
Montgomery County

Amy Seier
Kingsford Elementary Magnet School
Prince George’s County



TRAIL MIX

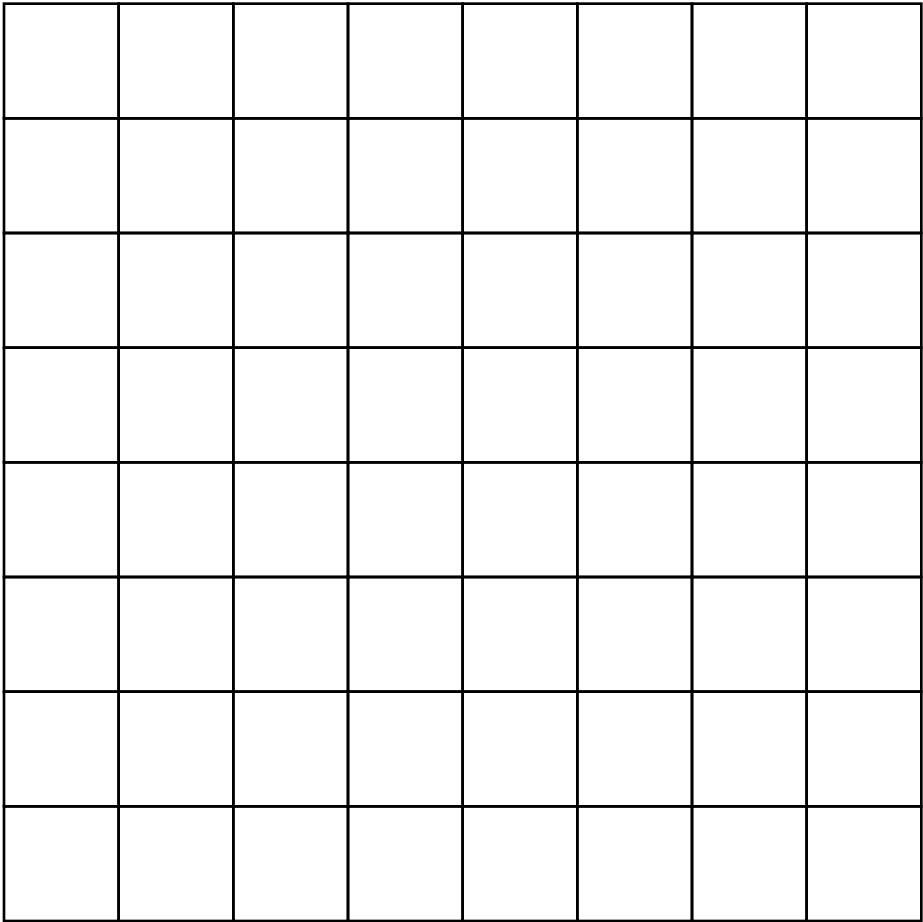
Survey Sheet

Student Resource Sheet #2

Item	Individual Preference (choose 4)	Class Preference	Fractional Part	Percentage of Class	Total Amount of Item	Cost Per Cup	Total Cost
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
TOTAL							

CREATE A GRAPH

Be sure to include: title, labels, accurate data



Write 3 pieces of information that you learned from this graph.

- 1. _____

- 2. _____

- 3. _____

Fractions Are Fun!

Name _____

After making a percentage wheel by following the instructions on the next page, find the percent equivalents for the following fractions:

$$\frac{1}{2} = \underline{\hspace{1cm}}\%$$

$$\frac{1}{12} = \underline{\hspace{1cm}}\%$$

$$\frac{5}{12} = \underline{\hspace{1cm}}\%$$

$$\frac{3}{4} = \underline{\hspace{1cm}}\%$$

$$\frac{5}{6} = \underline{\hspace{1cm}}\%$$

$$\frac{1}{10} = \underline{\hspace{1cm}}\%$$

$$\frac{3}{10} = \underline{\hspace{1cm}}\%$$

$$\frac{3}{8} = \underline{\hspace{1cm}}\%$$

$$\frac{1}{6} = \underline{\hspace{1cm}}\%$$

$$\frac{7}{12} = \underline{\hspace{1cm}}\%$$

$$\frac{2}{5} = \underline{\hspace{1cm}}\%$$

$$\frac{1}{5} = \underline{\hspace{1cm}}\%$$

$$\frac{1}{8} = \underline{\hspace{1cm}}\%$$

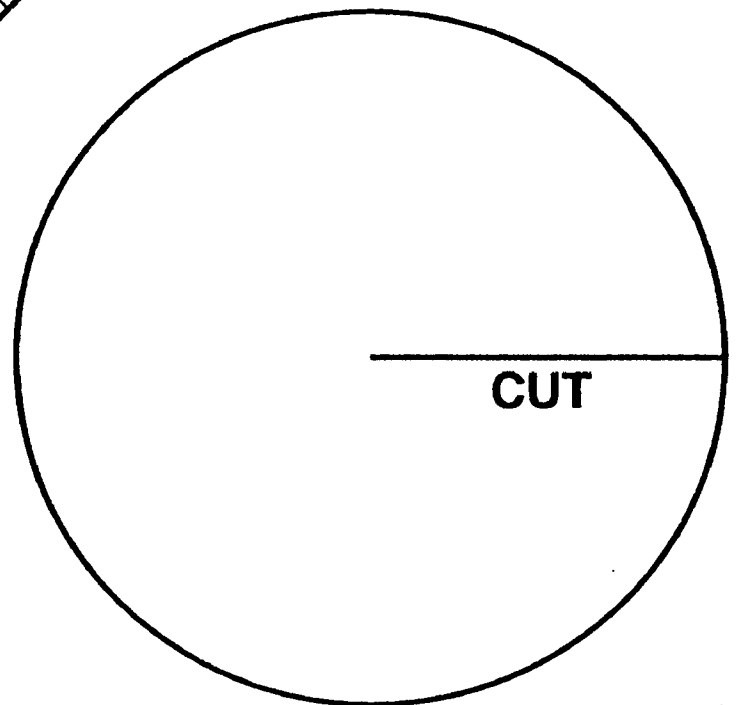
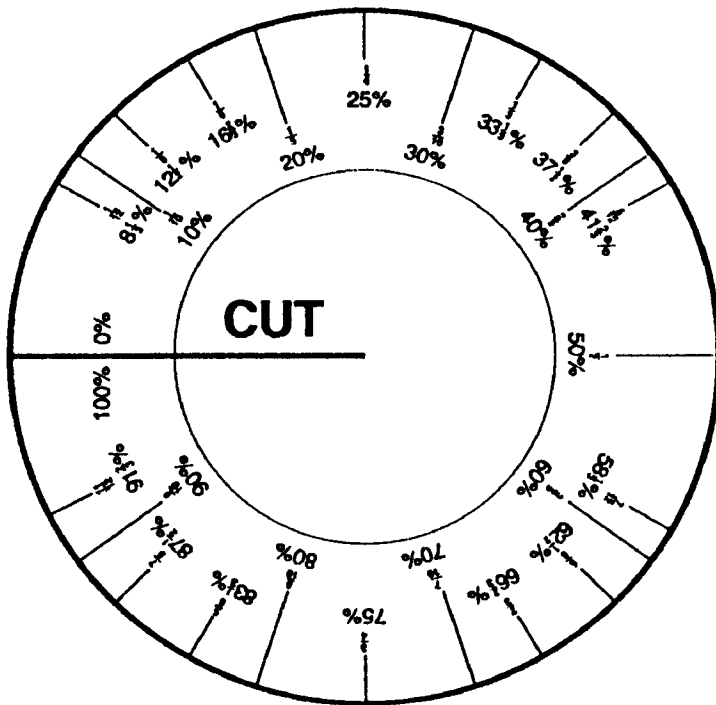
$$\frac{1}{4} = \underline{\hspace{1cm}}\%$$

$$\frac{1}{3} = \underline{\hspace{1cm}}\%$$

$$\frac{2}{3} = \underline{\hspace{1cm}}\%$$

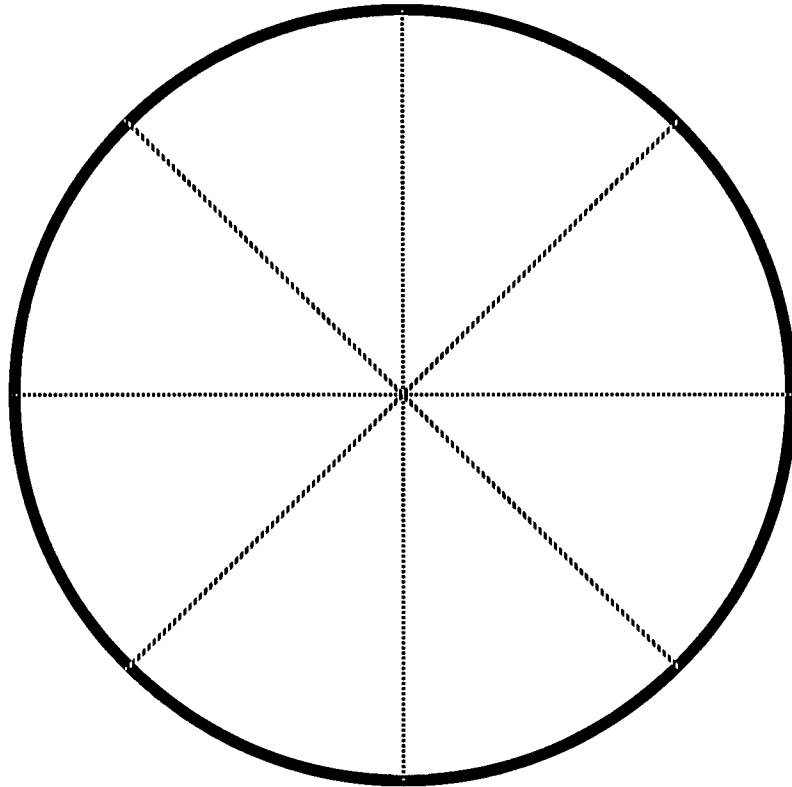
Percentage Wheel Instructions

1. Cut out the two circles.
2. Cut along the thick line in each circle from the outside to the center. DO NOT cut all the way through the circle.
3. Hold the blank circle in your left hand and the other one in your right hand. Slide the two circles together so that the centers meet.
4. Move the blank wheel around to show the fraction and the percent.



CREATE A CIRCLE GRAPH

Be sure to include a title, and label all sections of your graph with the item percentage.



Write 3 pieces of information that you learned from this graph.

1. _____

2. _____

3. _____

Salad Mix

Name_____

Date_____



Draw & Color Your Salad Mix



You have been invited to a party. The host, knowing your cooking expertise (NOT!), has asked you to bring a salad. To make the task even easier on you, your host has provided all the necessary information for you to make a salad everyone will enjoy. You need to be very accurate with your math skills in order to fulfill the guests' preferences.

Remember to: *Keep detailed, accurate journal entries including all calculations (Refer to Trail Mix journal for help)
Check-off each step as it is completed.

- _____ 1. Choose your preferences.
- _____ 2. Calculate the fractional part and class percentage.*
- _____ 3. Create two graphs (one must be a circle graph) and label all parts.
- _____ 4. Interpret graphs.
- _____ 5. Find total amount of items. (Hint - Divide class preference by 4)*
Use calculators if necessary.
- _____ 6. Find total cost of items. (Hint - Multiply class preference by 1/4 cup price)* Use calculators if necessary.
- _____ 7. What is the total price of the party salad?*
- _____ 8. How much change would you get back if you paid with a \$100 bill?*

SALAD MIX

Survey Sheet

Student Resource Sheet #8

Item	Individual Preference (choose 4)	Class Preference	Fractional Part	Percentage	Total Amount of Item	Cost Per 1/4 Cup	Total Cost
1. Lettuce		25				.55	
2. Carrots		13				.46	
3. Tomatoes		8				.80	
4. Cucumbers		22				.21	
5. Peppers		5				.68	
6. Cheese		11				1.03	
7. Bacon Bits		13				.99	
8. Croutons		3				.74	
TOTAL							

CREATE A GRAPH

Be sure to include: title, labels, accurate data

Write 3 pieces of information that you learned from this graph.

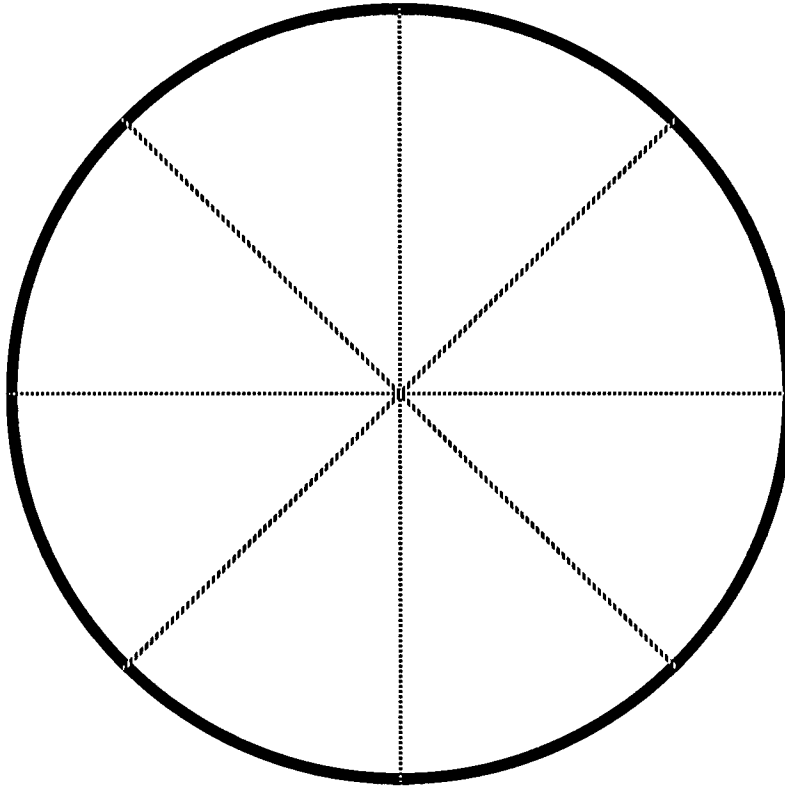
1. _____

2. _____

3. _____

CREATE A CIRCLE GRAPH

Be sure to include a title, and label all sections of your graph with the item percentage.



Write 3 pieces of information that you learned from this graph.

1. _____

2. _____

3. _____
